Declaration of Robert Judd

1. My name is Robert Judd. I am a resident of North Carolina over the age of 21 and am competent to give testimony. This is my second Declaration in this proceeding. My background and expertise is described in detail in my first Declaration ("Judd 1"). My Curriculum Vitae further describes my expertise. (Exhibit 14)

2. Merge has identified several terms in the '381 patent that it claims are ambiguous. These terms include "software," "executing outside the Internet web browser," and "incompatible with displaying in an Internet web browser."

3. A person of skill in the art of medical image management who reviews the specification and file history of the '381 patent will recognize that these terms are clearly and intrinsically defined.

4. Software running outside the browser. The concept of using "software running outside the browser" to process images was described in detail in the specification. In the Background of the Present Invention section, the patent stated: "Using the 'Java' model, the client is no longer simply using the browser to view 'static' files downloaded from the server, but rather in addition **the client's computer is running a program that was sent from the server.**" ('381 patent, col. 3, lns. 23-26). The phrase "software executing outside the Internet web browser" was added to claim 1 in the Amendment of December 22, 2011 to distinguish the Bernadett patent. (Exhibit 15, p. 7) ("Bernadett teaches a method that requires **software executing outside an Internet web browser, namely an MPEG viewer**."). The Examiner's Summary of a February 24, 2012 interview noted that "[i]n the two references … these web format **images are viewed on the web browser with an additional software**, unlike in the invention, the medical images are viewed on the web browser without any software executing outside the web browser." (Exhibit 16)

Thus, "software executing outside an Internet web browser" means external software for presentation of images, exemplified by Java and MPEG viewers.

5. Incompatible with viewing in a web browser. The file history is full of references to the display of images in a web browser. The '381 specification states that "[i]n practice, modern computing hardware can be used to convert the image data from **non-web compatible format (such as DICOM)** to web-compatible format in just a few seconds." ('381 patent, col. 10, lns. 51-54). Step 5010 in Figure 8 is "Current 'item' (e.g. each thumbnail and full-screen view) **converted to web-compatible format (e.g. 'GIF')**." The Summary of the Invention section explains: "if medical images of different formats could be processed in such a way that limitations of current Internet standards could be overcome, any *standard Internet browser* could be used as a diagnostic workstation ... *without specialized hardware or software*." ('381 patent, col. 4, lns. 7-13) (emphasis added). Thus, the meaning of "incompatible with displaying in an Internet web browser" is, simply, a format that cannot be viewed in a standard Internet browser without the assistance of external software that facilitates the presentation of images. DICOM is an example.

6. Software. Dr. Shih argues that the word *software* could mean "system software," "application software," or "any code or algorithm." (Shih, ¶12) However, as described above, the type of software referenced in the claim is software on the client computer that supplements or replaces the Internet web browser's image viewing capabilities, such as Java or an MPEG viewer. Therefore, the suggestion that this refers to mouse software or the software running on the server is baseless. In fact, the preferred embodiments described in the specification require mouse functionality on the user's computer and image processing software running on the server. For example, at col. 8, line 51 - col. 9, line 12, the specification describes how software on the

server (the "post engine") processes images, posts them to a webpage on the "http server," and alerts the physician so that he can "double click" his mouse on the user computer to view the images. It is my understanding that a claim interpretation that would exclude a preferred embodiment is rarely, if ever, correct. In this case, interpreting the term "software" to include software on the server or mouse software would exclude a preferred embodiment described in the specification.

7. Medical diagnosis. The U.S. Food and Drug Administration (FDA) regulates medical imaging devices for diagnostic uses. As described in the Complaint, Merge and Heart IT have both obtained FDA 510(k) approval for their zero-footprint viewers. While this is not the sole criteria for whether an image viewer permits "medical diagnosis," it is a strong indicator that it transmits sufficient information to satisfy this claim element.

8. Invalidity. Merge's technical experts Shih and Agarwal have both argued that the invention of the '381 patent is anticipated by the Feingold and Sakusabe references and is also obvious. I disagree with these opinions.

9. Merge's invalidity assertions originate in part from a confused description of the workflow associated with medical imaging procedures. Any person skilled in the art can attest that the following is an exemplary description of the activities associated with a patient imaging procedure.

IMAGING PROCEDURE. A referring physician, such as an orthopedic surgeon, sends their patient to radiology for an MRI. Images are acquired in groups known as "series" (a standard terminology further described later in this affidavit). At the completion of the MRI scan, all of the images from all of the image series are transferred to a diagnostic workstation.

DIAGNOSIS. At the diagnostic workstation, a radiologist views all of the image series, as well as all of the images within each series, in order to make a medical diagnosis. The diagnostic workstation must display the images at their full resolution, provide a mechanism to navigate amongst the different image series, and allow multiple image series and/or scans to be viewed side-by-side. The focus of the '381 patent is a diagnostic workstation that radiologists can use to make medical diagnoses.

DISTRIBUTION. The radiologist then sends the official textual report and selected exemplary images to the orthopedic surgeon for record keeping and/or patient consultation purposes. Selected exemplary images are important for patient consultation because 95% of referring physicians (eg. the orthopedic surgeon) do not want the radiologist to provide the diagnosis directly to the patient. (Exhibit 17, p.122) The focus of the papers by Feingold and Sakusabe is the distribution of selected exemplary images to referring physicians for record keeping and/or patient consultation purposes.

10. Anticipation by Feingold. Feingold was published in 1997 and was co-authored by Reuben Mezrich, then Chairman of the Department of Radiology at the Hospital of the University of Pennsylvania ("HUP"). (Exhibit 18) Feingold describes HUP's implementation of a system first described in Dr. Mezrich's 1995 paper. (Exhibit 19) Mezrich's 1995 paper was considered by the patent examiner during prosecution of the '381 patent. Other prior art similar to Feingold was also considered by the examiner, including Wong (1995)(Exhibit 20), Wong (filed 1998)(Exhibit 21), Wong (1999)(Exhibit 22), and Filler (filed 2000)(Exhibit 23). All of these references teach converting medical images into browser compatible formats and transmitting them over the Internet. However, none of them created a virtual workstation for the purpose of determining a medical diagnosis; instead, they all described the distribution of

selected exemplary images to referring physicians, students, or research collaborators for record keeping, patient consultation, teaching, or research purposes.

11. The Feingold paper describes a system to distribute selected images after diagnosis is complete. "***Targeted*** images and reports are automatically routed from the PACS and RIS for storage on the web server."(Shih Exhibit 11, p.60) Once on the web server, "The image server application has been modified to post process images after arrival" (Shih Exhibit 11, p. 63). The post processing method of Feingold ***discards three out of every four image pixels***: CR images are subsampled from 2048x1780 to 1024x890, and CT images are subsampled from 512x512 to 256x256 (Shih Exhibit 11, p. 63). The two numbers indicate the number of pixels horizontally and vertically; thus a 512x512 image has 262,144 pixels. Subsampling to 256x256 resolution reduces this to 65,536, a four-fold reduction. Any person of ordinary skill in the art would recognize that discarding 75% of the image pixels results in a profound and irreversible loss of diagnostic information. The images in Feingold are non-diagnostic quality images with only 25% of the original resolution.

12. Anticipation by Sakusabe. The Sakusabe paper, also asserted by Merge as prior art, was published six months *after* the invention of the '381 patent was disclosed to Northwestern University in August 1999. Therefore Sakusabe does not have priority over the '381 patent. Even if Sakusabe is considered prior art, Sakusabe references the Feingold paper (reference 4) and describes the same goals, namely a "*Low cost image delivery*" system (Shih Exhibit 9, p. 359) for the distribution of selected exemplary images to referring physicians for record keeping and/or patient consultation purposes. Sakusabe specifically state that they do not describe processes fundamental to any image management system: "*We did not focus on acquiring,*

*managing, and selecting images, which is important for an actual display system*" (Shih Exhibit 9, p. 364). Moreover, Sakusabe specifically disclaims the usefulness of his system for diagnosis:

> Of course we don't say 'All imaging workstations could be replaced by Web browser'. Especially, for a radiologist who wants to use this for a primary diagnosis, there is some lack of performance. In this case, the radiologist needs large and high quality images…

(Shih Exhibit 9, p. 364). Merge's expert, Dr. Shih, ignores this section of Sakusabe yet quotes the sentence that immediately follows (Shih, ¶33): "*this architecture may be useful for most clinicians in a hospital, and for a radiologist who is in the situation that he/she could not use high performance imaging workstation*". This latter sentence is the only evidence offered by Dr. Shih in support of his conclusion that the system of Sakusabe permits medical diagnosis (Shih ¶33). I do not dispute that a handful of selected, lossy, non-diagnostic images may occasionally be diagnostically useful. However, in virtually all cases such a system could not be used to make medical diagnoses. In addition to providing non-diagnostic images, Sakusable fails to provide a pointer associated with a procedure - it only has a URL associated with individual images. Sakusabe also fails to provide a thumbnail to represent an image series, and does not describe a mechanism allowing navigation amongst multiple image series as is required when making a medical diagnosis. In fact, Sakusabe's Figure 2 that Dr. Shih presents in ¶30 and ¶31 is described by Sakusabe as their "*SeriesViewer*" that "*displays a series of DICOM images*" (Shih Exhibit 9, p. 362). As further discussed below, anyone skilled in the art would immediately recognize the difference between the standard terms "series" and "images," and therefore would immediately recognize that Sakusabe do not describe ***any*** mechanism to navigate from one series to another, using a thumbnail or otherwise, as required by Claim 1 of the '381 patent.

13. Like other prior art considered by the '381 patent examiner, Feingold and Sakusabe both describe systems designed to distribute a handful of pre-selected non-diagnostic quality images

along with a text report to referring physicians for record keeping and/or patient consultation purposes. Such systems are far easier to design compared to a system that permits determination of the medical diagnosis. Unlike Feingold and Sakusabe, the '381 patent describes a medical image management system that receives complete patient imaging procedures in a non-browser-compatible format, displays all of the images in an Internet web browser with diagnostic-quality, provides a mechanism to navigate amongst multiple image series within a single study, displays image series and/or studies side-by-side, assembles movies of the beating human heart that play at the physiologically-accurate heart rate, allows physicians to share entire medical procedures simply by clicking on a web browser URL in an email message, and provides access to diagnostic-quality medical images from anywhere in the world by storing them in the Internet "cloud", rather than on a server accessible only within a single hospital. As such, the scope of the problems considered by the '381 patent, and the detailed descriptions of solutions to those problems, are far more complex than the simple systems described by Sakusabe and Feingold.

14. The claim elements of the '381 patent are based on a hierarchy of terms that would be obvious to anyone skilled in the art. In the DICOM standard, as well as in other imaging contexts, the terms Patient, Study, Series, and Image have specific meanings. As illustrated in the following chart from the DICOM standard, a **patient** has one or more **studies** (or procedures, such as an MRI scan); a **study** contains one or more **series** (multiple images taken together as a group). Most studies, also known as procedures, consist of many series - for example, an MRI study of the heart might have series for the (1) a group of anatomical images that "bread loaf" the patient's torso from the shoulders to the waist; and (2) a "movie loop" depicting heart contraction. Each **series** ("bread loaf" or "movie loop") is composed of one or more **images**

(slices of bread, or frames of the movie). Each image can be considered the equivalent of a single exposure.

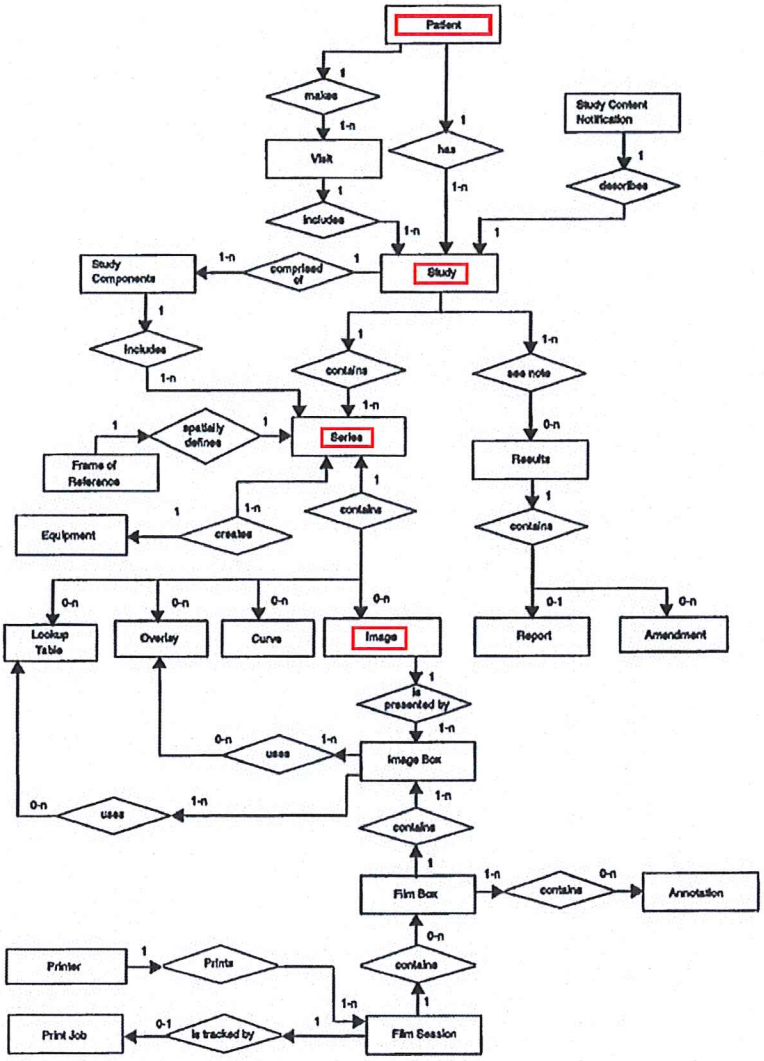



**Figure 7-1—DICOM model of the real-world**

15. This same hierarchy of terms is used in the '381 patent. The phrase in Claim 1 "providing a pointer associated with the patient medical procedure" means that the pointer refers to a study. The phrase "receiving at a first computer a plurality of image series resulting from a patient medical imaging procedure" means that more than one series from the study are received by the first computer (more than one "bread loaf", or "movie loop"). The phrase "each series

comprising one or more digital medical images" means that each series has one or more images from the procedure (one or more slices of bread, or frames of a movie). The phrase "the plurality of navigational images corresponding to different ones of the image series" means that the navigational images, or thumbnails, each represent a separate series from the study ("bread loaf" or "movie loop").

16. Displayed below is a table summarizing the differences between the Sakusabe and Feingold references and the elements of Claim 1.

| **Elements of Claim 1** | ***Sakusabe et al.*** | ***Feingold et al.*** |
|---|---|---|
| [1] A method of managing medical information, comprising: receiving at a first computer a plurality of image series resulting from a patient medical imaging procedure, each image series comprising one or more digital medical images in a format that is incompatible with displaying in an Internet web browser; | Sakusabe does not teach receiving *a plurality of image series from a patient medical imaging procedure.* It only teaches receiving a plurality of images. | Feingold does not teach receiving *a plurality of image series from a patient medical imaging procedure.* It only teaches receiving a plurality of images. |
| [2] providing a pointer associated with the patient medical imaging procedure; | Sakusabe does not teach a pointer associated with the *medical imaging procedure,* only a URL associated with a particular image. | Feingold Fig. 3 appears to provide a pointer associated with an imaging procedure. |
| [3] in response to user selection of the pointer at a second computer, providing an Internet web page for display in an Internet web browser on the second computer, the Internet web page forming a user interface for a medical image workstation when displayed in the Internet web browser without requiring software executing outside the Internet web browser in the second computer, the user interface comprising a rectangular grid of one or more rows and one or more columns for simultaneously displaying a plurality of navigational images in the user interface of the Internet web page, and | Sakusabe does not teach selecting a pointer associated with a *procedure*, and does not teach the ability to view multiple *series.* | Feingold does not teach the ability to view multiple *series,* only the ability to view multiple images within a single series. |
| [4] providing to the user the plurality of | Sakusabe does not | Feingold does not teach |

| | | |
|---|---|---|
| navigational images for display in the user interface of the Internet web page, the plurality of navigational images corresponding to different ones of the image series from the patient medical imaging procedure, the plurality of navigational images comprising a format that is compatible for displaying in an Internet web browser without requiring software executing outside the Internet web browse on the second computer, the plurality of navigational images being converted to a browser compatible format before being transmitted over the Internet; and | teach thumbnails (navigational images) that correspond to different image series from the procedure, only thumbnails that correspond to different images within a single series (the "SeriesViewer" of Fig 2). | thumbnails (navigational images) that correspond to different image series from the procedure, only thumbnails that correspond to different studies within a single patient (left side of Fig. 4), and thumbnails that correspond to different images within a single series (bottom of Fig. 4). |
| [5] in response to user selection of one of the plurality of navigational images, providing to the user the one or more digital medical images of the image series associated with the selected one of the navigational images for display in the user interface of the Internet web page, the one or more digital medical images comprising a format that is compatible for displaying in the Internet web browser without requiring software executing outside the Internet web browser on the second computer, the one or more digital medical images providing medical information to the user, the one or more digital medical images being converted to a browser compatible format before being transmitted to the second computer, | Sakusabe does not teach providing *the one or more digital medical images of the image series* associated with the thumbnail. It provides one *image* per thumbnail. | Feingold does not teach providing *the one or more digital medical images of the image series* associated with the thumbnail. It provides one *image* per thumbnail. |
| [6] wherein the medical image workstation enables user navigation among the plurality of navigational images and the one or more digital medical images of the image series to permit medical diagnosis from the one or more digital medical images without requiring software executing outside the Internet web browser. | Sakusabe does not provide series navigation, and it does not permit medical diagnosis. | Feingold does not provide series navigation, and it does not permit medical diagnosis. |

17. Obviousness. Shih and Agarwal also claim that the '381 patent is obvious. There is overwhelming evidence that suggests otherwise.

18. Shih's affidavit referred to a 2000 article by DeJarnette (Shih Exhibit 15) to show that web-based medical imaging was obvious. The DeJarnette article presented by Dr. Shih actually **teaches against** the use of a zero-footprint viewer, stating that:

> This simple Web server-based teleradiology model has a number of disadvantages …The only justification for such a simple model is cost…**This model, however, is unsuitable for any application other than the transfer of an image with a text report to referring physicians for record keeping and/or patient consultation purposes.** It is possible to overcome the limitations inherent in this model, by creating a specialty Web browser or tailoring a general purpose Web browser by means of applets and/or plug-ins…It must be remembered, however, that the simple Web server-based system offers only limited features.

19. This sentiment is the same that was expressed in the Huang textbook cited in my first Declaration (Judd 1, Exhibit 8). Huang taught that images needed to be transferred over the Internet in DICOM format and converted at the client computer using specialized software, such as ActiveX, an MPEG viewer, or Java. That is exactly how the Cedara I-SoftView viewer, which was introduced and FDA approved in 2002, operates. The I-SoftView viewer is the product that Merge sold until it introduced the Accused Products in 2009. Attached as Exhibit 24 is a copy of the FDA 510(k) for this product.

20. Prior to 2008, no company other than Heart IT offered an FDA-approved zero footprint viewer. The following table shows that, of Merge's primary competitors (Tolle ¶15) that also offer a "zero download" viewer (Tolle ¶15), ***every one of Merge's top 10 competitors*** announced or introduced their "zero download" viewer ***after 2010***. Merge, as described in the Complaint, introduced their zero-footprint viewer in 2009. If the '381 patent were obvious, as asserted by Merge, then why did Merge and the rest of the imaging industry wait until after Heart IT widely advertised its technology in 2008 (Complaint Exhibit E) to come out with zero-footprint viewers?

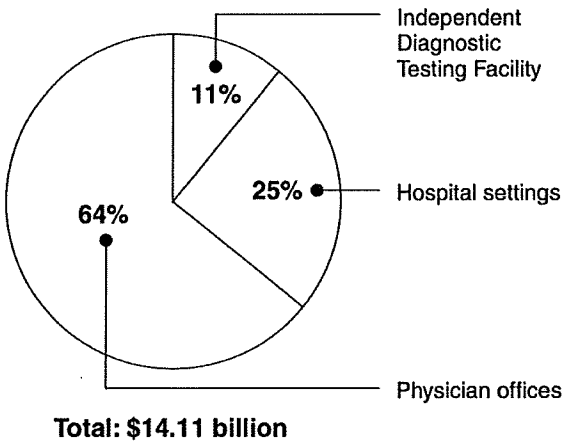
| Merge's Top Competitors, According to Merge's Expert Witness (Steven Tolle) | BEFORE October 14, 2008 | | October 14, 2008 Heart IT launches webpax.com | AFTER October 14, 2008 |
|---|---|---|---|---|
| | NON-"zero download" Product [1] | "zero download" Product | | NEW "zero download" Product [2] |
| 1) Calgary Scientific | FDA 510(k): K062164 | None | ----------> | 4/2012: K120076 |
| 2) Client Outlook | None | None | ----------> | 5/2011: K111164 |
| 3) Vital Images | FDA 510(k): K061624 | None | ----------> | * 9/2012: K122136 |
| 4) Carestream Health | FDA 510(k): K083673 | None | ----------> | * 10/2012: K122523 |
| 5) GE Healthcare | FDA 510(k): K082318 | None | ----------> | * 11/2012: K123174 |
| 6) Siemens Healthcare | FDA 510(k): K040970 | None | ----------> | "Image Sharing and Archiving" |
| 7) ScImage | FDA 510(k): K073169 | None | ----------> | "PicomWeb" |
| 8) Intelerad | FDA 510(k): K070080 | None | ----------> | 6/2011: "Inteleconnect" |
| 9) Medical Insight | FDA 510(k): K051809 | None | ----------> | * 12/2012: "EazyViz" |
| 10) Teramedica | None | None | ----------> | "Univision" |

[1] *Based on searches of FDA website using company name provided by Tolle ¶15*
[2] *Based on searches of FDA website and Google searches using product name provided by Tolle ¶17*
*Denotes products introduced ***after*** filing this lawsuit.

21. Merge's expert, Steven Tolle, states that GE Healthcare is one of Merge's "primary competitors" (Tolle, ¶15). As recently as October 2012 GE Healthcare's competing product was Centricity PACS IW (Exhibit 25). The "IW" acronym refers to IntegradWeb (Exhibit 25), a product originally developed by Dynamic Imaging, a company acquired by GE in 2007 (Exhibit 26). Exhibit 27 is a 2006 letter sent to Heart IT's attorneys by Alex Natanzon, Ph.D., then a senior executive at Dynamic Imaging, describing how their IntegradWeb product functioned. Dr. Natanzon states that "*We never perform any conversion of images into any of these [browser compatible] formats*", where the "*browser compatible formats" are "GIF, PNG, JPEG, or MPEG*", because "*browser-readable formats*" are "*lossy compressed*" versions of the "*true image bitmap*" (Exhibit 27, p. 1) Dr. Natanzon further states that "*Any person skilled in the art and the*

*industry of medical imaging will confirm that functional capacity of web browser is not enough for building a fully featured enterprise PACS for primary reading*" (Exhibit 27, p. 4). If the '381 patent were obvious, why did GE's chief software architect state in 2006 that such a product was not possible? Note that in November 2012, two months ***after*** Heart IT filed this lawsuit, GE received FDA 510(k) approval for a newly-developed zero footprint viewer (see row #5 in Table above).

22. Relevant Market. Dr. Shih asserts that I have mischaracterized the market and overstated the "*share of the market remaining up for grabs.*" Dr. Shih argues that 98.5% of hospitals with over 500 beds have already adopted a PACS, that PACS installations typically include a medical image viewer, and concludes that the market for image viewers is therefore saturated. I agree with Dr. Shih's statistics, but disagree with his conclusion. Most hospitals have multiple PACS systems, such as a radiology PACS, a cardiac catheterization lab PACS, an echocardiology PACS, and many others meaning that there is no single viewer available for hospital-wide EHR integration. In this setting, a zero footprint viewer for all imaging modalities across all hospital departments has significant advantages. More importantly, according to the Government Accountability Office (GAO) hospitals account for only 25% of all medical



imaging procedures in the United States (Exhibit 28, p. 91). In fact, nearly two-thirds of all medical imaging procedures in the United States are performed in physician offices, yet few of these small healthcare providers have PACS systems or EHR systems. One of the primary goals of the Federal Meaningful Use incentive program is to encourage small healthcare providers to adopt electronic medical records systems, including images.

23. The cornerstone of Heart IT's business plan is to allow sharing of medical images between hospitals and physician offices by leveraging the advantages of a zero footprint viewer. Heart IT's business plan was described in detail in a grant application submitted to the National Institute of Health (NIH) in 2010 (Exhibit 28). The scientific section of Heart IT's NIH grant application specifies that "*The opportunity of our proposal arises from the fact that [Heart IT] has developed a PACS system that ... allow[s] any Internet web browser to function as a medical imaging workstation (Firefox, Safari, Chrome, or Internet Explorer running on Windows, Mac OS, or Linux) without the need to install client software (no thick client, no ActiveX, no Java, no FLASH)*" (Exhibit 28) In other words, Heart IT's primary business advantage is its patent-protected zero footprint viewer. The business section of Heart IT's NIH grant application estimates a net present value (NPV) of $46 million derived from revenues received between 2014 and 2018. (Exhibit 28, p. 86)

24. Heart IT's grant application received an exceptionally good score from NIH's scientific reviewers, and was awarded $2.5 million of Federal funding effective August 15, 2011. Under this grant, Heart IT is currently collaborating with Johns Hopkins Health System to use WebPAX systems to share medical images across the State of Maryland and Washington, DC.

25. Heart IT's entire business plan is being undermined by Merge's infringement. Heart IT's entire product line is based on our patent-protected zero footprint viewer. By offering products

operating on the same principles and offering the same benefits, Merge has effectively neutralized our single most important advantage in the marketplace.

26. Heart IT has successfully competed against Merge in Providing Large-Scale Systems. Merge and Heart IT competed against each other in a Request for Proposals (RFP) from St. Vincent Health System in Indianapolis, Indiana. St. Vincent Health System is affiliated with Ascension Health System, one of the largest non-profit healthcare organizations in the United States. The RFP called for a system to receive DICOM-formatted medical images from two geographically-distant hospital locations, and provide access to images from both hospitals to physicians located throughout the state of Indiana. The RFP process included a total of 11 competitors, including Merge and Heart IT, and was managed by Zannett Consulting, Inc. Heart IT was selected as the winner of the RFP competition. To the best of my knowledge, Merge did not offer a zero-footprint viewer to this customer at the time of this RFP competition (early 2010).

27. Merge's actions have already caused irreparable injury to Heart IT. After Heart IT received a contract from St. Vincent Health System, its parent organization, Ascension Health, began a systematic evaluation of medical image management systems with the goal of selecting a preferred vendor for all of its 500 locations. After Heart IT filed its Motion for Preliminary Injunction against Merge, Heart IT was informed by Ascension Health that Merge Healthcare had been selected as its preferred vendor for image integration into Ascension Health's EHR systems using Merge's Accused Products. Heart IT was also informed by Ascension Health that, as a direct consequence of Merge's selection as its preferred vendor for EHR image integration, one of Heart IT's long-time customers will be replacing Heart IT's WebPAX system with Merge's system effective March 1, 2013 (The Heart Group, part of St. Thomas Hospital,

Nashville, TN). Heart IT was further informed by Ascension Health that the Heart IT system at St. Vincent Health, where Heart IT competed successfully against Merge, will probably be replaced by Merge's system when the current five-year agreement expires in 2015 as a direct consequence of Merge's selection by Ascension Health as their preferred vendor for EHR image integration.

28. Merge's November 2012 Investor Presentation lists a "$2+ million" sale to "Ascension Health" as one of its "recent significant wins." (Exhibit 29, p. 10)

29. In early 2012 Heart IT's VP of Sales (Hiram Perez) and its CTO (Brent Reed) were in negotiations with St. Francis Hospital in Indiana, which is part of the Franciscan Alliance. This prospective customer was very interested in WebPAX and, while sitting at a conference room table during Heart IT's second site visit, St. Francis appeared ready to sign paperwork. When we followed up, they abruptly stopped talking to Heart IT with no clear reason. Soon afterward, Merge issued a press release stating that "*Franciscan Alliance, Inc. has selected Merge Healthcare's iConnect® Access* to image-enable their EMR and provide real-time access to radiology and cardiology images and information across its network of 13 hospitals in Indiana and Illinois.*" (Exhibit 30) The press release emphasized that "*iConnect Access provides a true 'zero-footprint' image viewing capability and can be embedded into many third-party products*" (such as an EHR). St. Francis is only one of 13 hospitals within the Franciscan Alliance, strongly suggesting that subsequent sales that might have gone to Heart IT also shifted to Merge.

30. Heart IT has been in negotiations with Lutheran General Hospital near Chicago to sell a WebPAX system for over 12 months. Lutheran General Hospital is part of the Advocate Healthcare system. During the course of Heart IT's negotiations with Lutheran General, Advocate Healthcare announced that it had "*partnered with Merge Healthcare*" and planned to

implement Merge's "*iConnect® Access, a zero-download DICOM image and XDS viewer*" (Exhibit 31). Lutheran General is only one hospital within the Advocate Healthcare system. According to the Advocate Healthcare website, Advocate has more than 250 sites of care, including 10 acute-care hospitals. Merge's November 2012 Investor Presentation lists a $5.3 million sale to Advocate Healthcare as another of its "*recent significant wins.*" (Exhibit 29, p. 10)

31. Merge's irreparable harm to Heart IT includes exclusion from customer consultation important to product improvements. Prior to Ascension Health's selection of Merge as its preferred provider for EHR image integration, Heart IT had regular interactions with Ascension Health's "Digital Imaging Community of Excellence" (DICE), which includes a person named Carol Joseph. In recent months communications between DICE and Heart IT have stopped, yet Ms. Joseph was a speaker at Merge's August 2012 Client Conference. (Exhibit 32) Extensive communication with customers is of fundamental importance to vendor product development roadmaps, yet the communication between DICE and Heart IT has apparently shifted to Merge. Note that Dr. Agurwal, one of Merge's experts in this case, presented a product development roadmap for the Accused Products at the same meeting attended by Ms. Joseph (Exhibit 33), and that many of Ms. Joseph's recommendations appear in Dr. Agurwal's roadmap.

32. Merge's Senior Vice President Steven Tolle has disputed my description of the market for zero-footprint viewers. Mr. Tolle's statements directly contradict Merge's own literature and presentations to the financial community. In a presentation to J.P. Morgan Chase in January 2013 (Exhibit 34, p. 16), Merge identified "*Interoperability*" as one of the key markets for Merge's products. Merge stated that its "*key solutions*" for that market were the accused Access viewer, the Share gateway for image sharing, and the Enterprise Archive VNA. Merge claims to hold a 61% share of this market, with 190 clients. In their November 2012 Investor Presentation

Merge specifically highlights the importance of their "*Interoperability*" solutions, stating that "*Meaningful Use & interoperability accelerate demand; in their infancy.*" (Exhibit 29, p. 22) With 61% of this rapidly-growing market, Merge is Heart IT's single biggest competitor for interoperability solutions whose distinguishing feature is a zero-footprint viewer.

33. Every "*Interoperability*" solution that Merge installs effectively excludes Heart IT from profiting from its invention for years to come. While zero footprint viewers substantially reduce costs by eliminating the need for client software, the server-side software remains highly complex and prohibitively expensive for hospitals to replace. Specifically, installing a large-scale medical image management system at a healthcare system requires configuring redundant high-performance servers for real-time failover and load balancing, dedicated network paths and connectivity, configuration of third-party scanners, workstations, and PACS to allow the exchange of DICOM images, custom interfaces with third-party Enterprise password servers such as Microsoft Active Directory, custom interfaces with mass storage devices such as an EMC SAN, and custom interfaces with third-party EHR systems such as Epic and Cerner. All of these interfaces require systematic testing, certification of compliance with federal privacy rules, and official institutional approval before these systems can go-live. Heart IT has extensive experience with these large-scale installations as exemplified by St. Vincent Health System, Ohio State Hospital, Duke, and many others. Merge's systems are undoubtedly equally complex, and no hospital will want to incur the costs necessary to remove Merge's system once it has been successfully installed.

34. Merge's infringement is preventing Heart IT from being the "first-mover" in a rapidly-growing market. Each time Merge installs a new system Heart IT is locked out from selling its patent-protected product to that customer for years to come. This continuing loss of market

share, customer goodwill, and brand recognition within the market are the type of losses that monetary damages are insufficient to cure.

35. Delay in Seeking Preliminary Injunction. Merge asserts that a preliminary injunction should not be granted because Heart IT delayed in pursuing this case. Heart IT is a small company with limited resources, yet we have worked diligently to enforce our intellectual property rights. We first learned of Merge's iConnect Access product in fall 2010, and sent Merge a letter in January 2011 in search of a mutually-agreeable solution. Merge did not respond to our letter. At that time the '381 patent was nearing approval, so we waited until early spring 2012 for the '381 patent to issue before proceeding. In summer 2012 we prepared our case and filed in September 2012. In August 2012, while we were preparing the Complaint, the government issued the second round of Meaningful Use guidelines, which included incentives to incorporate images into Electronic Health Records for the first time. It took us a few months to prepare our motion for preliminary injunction, and we filed that in December 2012. Considering the complexity of this case and the limited resources available to Heart IT, I believe that we moved as fast as prudently possible to seek a preliminary injunction against Merge.

36. I declare under penalty of perjury that the foregoing is true to the best of my knowledge and belief.

Robert M Judd

Robert M. Judd, Ph.D.

Signed before me on this 6th day of February of 2013.

Sherry L. May

SHERRY MAY NOTARY PUBLIC My Commission Expires 04-25-15 VANCE COUNTY, NC